Aviation Investigation Final Report

Location:	Marshfield, Massachusetts	**Accident Number:**	ERA14LA043
Date & Time:	November 15, 2013, 15:45 Local	**Registration:**	N76RD
Aircraft:	Maule M-5-180C	**Aircraft Damage:**	Destroyed
Defining Event:	Loss of engine power (partial)	**Injuries:**	1 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot reported that the airplane departed with adequate fuel onboard (about 40 gallons) but that, about 400 feet above ground level, the engine lost partial power. Specifically, the rpm dropped to 1,500, and the engine began to "backfire." The pilot turned the airplane to avoid some houses and performed a forced landing into trees. After the impact, a fire ensued and consumed most of the wreckage. Subsequent examination of the engine and propeller governor did not reveal any preimpact mechanical malfunctions that would have precluded normal operation. Several engine accessories, including the magnetos and carburetor, could not be tested due to heat and impact damage. Additionally, no fuel samples could be tested because all of the fuel was consumed in the fire. The reason for the partial loss of engine power could not be determined.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

A partial loss of engine power for reasons that could not be determined in postaccident examinations because fire damage precluded testing of the fuel and several engine accessories.

Findings

Not determined	(general) - Unknown/Not determined

Factual Information

History of Flight

Initial climb	Loss of engine power (partial) (Defining event)
Emergency descent	Off-field or emergency landing
Emergency descent	Collision with terr/obj (non-CFIT)

On November 15, 2013, about 1545 eastern standard time, a Maule M-5-180C, N76RD, operated by a private individual, was destroyed when it collided with trees, following a partial loss of engine power during initial climb from Marshfield Municipal Airport (GHG), Marshfield, Massachusetts. The airline transport pilot was seriously injured. The personal flight was conducted under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed and no flight plan was filed for the planned flight to Falmouth Airpark (5B6), Falmouth, Massachusetts.

The accident flight was the first flight after an annual inspection had been completed on the airplane. The pilot had planned to fly the airplane from the maintenance facility back to his home airport. Witnesses reported that during initial climb, about 400 feet above ground level (agl), the pilot stated on the common traffic advisory frequency that he was returning to the airport due to a rough running engine. The airplane then banked left and descended into trees. Following the impact with trees, a postcrash fire consumed the wreckage.

The pilot stated that the airplane departed on runway 24 with 40 gallons of fuel. The engine then lost power as the airplane was climbing through 400 feet agl. Specifically, the rpm dropped to 1,500 and the engine started "back firing." The pilot then turned the airplane away from some houses and performed a forced landing into trees.

The airplane was equipped with a Lycoming O-360, 180-horsepower engine. The engine had accumulated 1,541 hours since major overhaul, which was performed in 1994. The wreckage was recovered to a facility and the engine was subsequently examined. The engine had separated from the airframe during the impact and postcrash fire. The propeller remained attached to the engine. One propeller blade was curled aft and bent at the tip. The other propeller blade was relatively undamaged except for charring near the tip.

The valve covers and top sparkplugs were removed from the engine. The sparkplug electrodes were intact and gray in color. The rear accessory section was heat damaged and removed to facilitate crankshaft rotation. The magnetos sustained heat damage and could not be tested. The engine driven fuel pump remained intact and was actuated by hand. The oil filter and oil screen were absent of debris and oil was noted throughout the engine. The carburetor was heat damaged and could not be tested. The vacuum pump was disassembled and its rotor vanes were intact. The propeller was then rotated by hand. Camshaft, crankshaft, and valve train continuity were confirmed to the rear accessory section and thumb compression was attained on all cylinders.

The propeller governor was subsequently examined at the manufacturer's facility under the supervision of a Federal Aviation Administration inspector. The governor could not be tested due to fire damage; however, a teardown examination of the governor did not reveal any preimpact mechanical malfunctions that would have precluded normal operation.

The recorded weather at GHG, at 1555, was: wind from 200 degrees at 10 knots, gusting to 19 knots; visibility 10 miles; clear sky; temperature 14 degrees C, dew point -2 degrees C, altimeter 30.14 inches Hg.

Pilot Information

Certificate:	Airline transport; Commercial; Flight instructor	**Age:**	68
Airplane Rating(s):	Single-engine land; Multi-engine sea	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	3-point
Instrument Rating(s):	Airplane; Helicopter	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	**Toxicology Performed:**	No
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	May 22, 2012
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	March 2, 2012
Flight Time:	16300 hours (Total, all aircraft), 2352 hours (Total, this make and model), 48 hours (Last 90 days, all aircraft), 40 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Maule	**Registration:**	N76RD
Model/Series:	M-5-180C	**Aircraft Category:**	Airplane
Year of Manufacture:	1984	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	8034C
Landing Gear Type:	Tailwheel	**Seats:**	4
Date/Type of Last Inspection:	October 23, 2013 Annual	**Certified Max Gross Wt.:**	2300 lbs
Time Since Last Inspection:	0 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	2834 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	C91 installed, not activated	**Engine Model/Series:**	O-360
Registered Owner:	On file	**Rated Power:**	180 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	GHG,9 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	15:55 Local	**Direction from Accident Site:**	60°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	10 knots / 19 knots	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:	200°	**Turbulence Severity Forecast/Actual:**	/ N/A
Altimeter Setting:	30.14 inches Hg	**Temperature/Dew Point:**	14°C / -2°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Marshfield, MA (GHG)	**Type of Flight Plan Filed:**	None
Destination:	Falmouth, MA (5B6)	**Type of Clearance:**	None
Departure Time:	15:45 Local	**Type of Airspace:**	

Airport Information

Airport:	Marshfield Municipal Airport GHG	**Runway Surface Type:**	Asphalt
Airport Elevation:	9 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	6	**IFR Approach:**	None
Runway Length/Width:	2999 ft / 75 ft	**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious	**Latitude, Longitude:**	42.098331,-70.672225(est)

Administrative Information

Investigator In Charge (IIC):	Gretz, Robert
Additional Participating Persons:	Scott Lavoy; FAA/FSDO; Lexington, MA Mike Childers; Lycoming Engines; Williamsport, PA
Original Publish Date:	September 29, 2014
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=88442